

RADIOACTIVE AND OTHER ENVIRONMENTAL THREATS TO THE UNITED STATES AND THE ARCTIC RESULTING FROM PAST SOVIET ACTIVITIES

HEARING
BEFORE THE
SELECT COMMITTEE ON INTELLIGENCE
OF THE
UNITED STATES SENATE
ONE HUNDRED SECOND CONGRESS
SECOND SESSION
ON

RADIOACTIVE AND OTHER ENVIRONMENTAL THREATS TO THE UNITED STATES AND THE ARCTIC RESULTING FROM PAST SOVIET ACTIVITIES

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STATEMENT OF ROBERT N. GATES, DIRECTOR OF CENTRAL INTELLIGENCE

Director GATES. Thank you, Mr. Chairman. I'm here today at the request of Senators Boren and Murkowski and the Senate Select Committee on Intelligence to address two issues: possible environmental threats resulting from past Soviet nuclear activities, and the role of the Intelligence Community in addressing environmental problems.

Let me first briefly discuss the role of the Intelligence Community with regard to environmental problems.

As the Senate and House Intelligence Committees know, on November 15th last year the President signed the most far-reaching directive to assess future intelligence priorities since CIA and the Intelligence Community were created in 1947. The directive required some 20 policy agencies and departments to identify their intelligence needs to the year 2005. Their responses highlighted the increased importance of environmental concerns as an intelligence issue. The National Security Council has integrated all of the expressed priorities into one overall document and the Intelligence Community is using this document as a guide for reallocating its resources.

Policy makers and members of Congress are asking CIA and the Intelligence Community to increase their study of environmental issues because we have special skills, resources and unique insights. For example, at the request of Senator Murkowski, a team of analysts has been working to assess the potential environmental consequences of long-term nuclear testing and waste disposal practices of the former Soviet Union. Earlier this year I was asked by the President's Science Advisor, Dr. Allan Bromley, and Senator Albert Gore to assist the National Aeronautic and Space Administration in its effort to collect and analyze satellite data on the environment. The project, called the Earth Observation System, will help scientists answer some of today's most pressing questions on the environment, such as how do the oceans, forests, deserts and atmosphere interact as an integrated system, and is the earth's climate changing? CIA will provide guidance to NASA concerning the most efficient means for processing the large quantities of data that it is collecting for this project, because we have a great deal of expertise in this area.

At Dr. Bromley's suggestion, the Intelligence Community recently assumed membership on the Committee on Earth and Environmental Research, which has become the primary coordinating body for national environmental problems and programs. Membership on the Committee will provide the Intelligence Community a better understanding of the Committee's activities and requirements and will improve intelligence support to our environmental policy makers.

Senators Gore and Murkowski also have asked whether CIA data could be released to environmental scientist who are studying global change; and I have agreed to form a team of cleared scientists who will examine our data and determine what would be useful to environmental science.

Under the Congressionally-directed Dual Use Technology Initiative, technologies developed under the auspices of the Intelligence

Community will be transferred to the private sector where appropriate; technology especially useful in answering questions in areas like the environment, law enforcement and medicine. Twelve projects costing \$30 million have been selected and roughly half of the money is for environmental projects.

Intelligence is also applying its special capabilities to other non-traditional areas, such as the environment and related foreign nuclear safety issues. For several years the CIA has brought a value-added to the work done on these problems, in our analysis, our unique collection assets, and in our ability to collect and assimilate vast quantities of information.

For example, CIA analysts assessed the scope of the unprecedented environmental damage which occurred when Iraqi forces sabotaged Kuwaiti oil fields last year. Agency specialists used enhanced commercial weather satellite imagery to track daily oil slick movements in the Gulf and they used unique collection systems and commercially available Landsat imagery to verify the number, location and status of the burning oil wells in Kuwait. The data used by the Central Command in the bombing that stopped the flow of the oil into the Gulf was provided by U.S. Intelligence. CIA worked with private experts to develop and build a computer model capable of projecting concentrations of key pollutants, primarily sulfur dioxide and particulates, and their impact on human health and crops.

Since the late 1980's the Intelligence Community has been contributing to U.S. government efforts to work with other countries to protect the global environment from a host of threats:

Ozone depletion, which poses risks of increased skin cancer, blindness, declining agricultural yields, and fisheries losses, will only be stopped by a worldwide effort, as laid out in the Montreal Protocol, to stop using chlorofluorocarbons, CFC's. The Intelligence Community has been following this problem for several years and is starting work on a program to determine whether we can monitor emissions of CFC's.

Tropical deforestation is a phenomenon that jeopardizes the world's climate, causes local problems such as flooding and mud slides, and leads to the extinction of plant and animal species. CIA analysts have done work on these issues, using satellite imagery and other tools to support U.S. policy makers in their multi-year effort to secure an international treaty on forest protection.

Possible climate change, and measures adopted by governments to reduce greenhouse gas emissions in an effort to avert it, have potentially far-reaching consequences. As U.S. negotiators worked at length to forge an international agreement on this important issue that opened for signature two months ago in Rio, CIA analysts provided them, over the course of a three-year period, with a comprehensive series of reports on this multi-faceted problem.

Other similar issues that are the subject of ongoing analytic work include ocean dumping of hazardous substances; water scarcity and degradation; the environmental consequences of narcotics cultivation; the impact of earthquakes and other natural disasters; food shortages, and agricultural resources decline; and the pressures faced by developing and industrialized countries alike as they grapple with the costs of environmental protection. While some of

these projects have been started within the past several years, many go back a long time. Our work on agriculture, for example, has been going on for decades.

A related subject for intelligence is monitoring the nuclear power programs in countries of concern. This is not a new issue for us. And it brings me to the second and primary part of my presentation: possible environmental threats arising from past Soviet nuclear activities. CIA has kept an eye on the Soviet nuclear power program since the start-up of their first small prototype power reactor in 1954. In the years that followed, we compiled an extensive collection of technical literature on the program and on the reactors themselves. CIA integrates this data with information acquired from our satellites to assess national security, economic, and safety implications of the program.

Since the Chernobyl disaster in 1986, CIA experts have worked closely with other U.S. government agencies to prepare detailed studies of Soviet-designed power reactors. We are now working with these agencies to determine the most effective way to improve the safety of these reactors. At the same time, we continue to collect information on reactor problems such as the recent accident at the Chernobyl-type reactor located near St. Petersburg, in Russia.

CIA has monitored Soviet handling of nuclear waste since 1948, when the reactor that produced the plutonium for the first Soviet nuclear weapon began operation. We now look at environmental contamination due to a variety of nuclear activities, most of which supported nuclear weapons acquisition and production, and questions about the safety of stored but radioactive liquid and solid waste. This includes the reprocessing of fuel from civilian and naval reactors and naval nuclear activities.

The former Soviet Union's attitude toward safety in handling of radioactive waste materials was, to say the least, lackadaisical from the very beginning of its nuclear program. Radioactive wastes resulting from the extraction of plutonium for the USSR's first nuclear weapons at Chelyabinsk-65 were discharged directly into the Techa River, resulting in severe contamination of the watershed for thousands of kilometers downstream. Subsequent practices were hardly better; highly radioactive waste was dumped into Lake Karachay at the plant beginning in 1951. Today, despite ongoing cleanup efforts, 120 million curies of radioactive materials are in the lake, and as little as one hour's exposure to the radiation at the shoreline could be fatal. Radioactive contamination in the groundwater has spread two to three kilometers from the lake. Additionally, an explosion in a waste tank at the site in 1957 contaminated over 23,000 square kilometers, and much of the land remains unusable today.

The situation in Chelyabinsk, although perhaps the most severe, is hardly unique. Similar plants in Tomsk-7 and Krasnoyarsk-26 also contaminated the local environment. Open pools of water at Tomsk reportedly contain elevated levels of plutonium and other radioisotopes, resulting in considerable wildlife contamination, including elk, duck, fish and hare, which are consumed by the local population. Reactors at the Krasnoyarsk plutonium production plant use water directly from the Yenisey River for cooling, and have contaminated the river with cesium, strontium, and other

radioisotopes for hundreds of kilometers downstream. One of these reactors remains operational today.

Even though these facilities are not in the Arctic, their impact has been observed in the region. All watersheds from these sites flow to the Arctic Ocean, and waste from the polluted Techa River reportedly was discovered in the Arctic as early as 1951. Moreover, the waste handling practices at these sites were all too typical of Soviet attitudes toward nuclear safety and the environment.

The greatest single source of radioactive contamination of the Arctic environment has been from nuclear weapons testing, especially atmospheric testing at the Novaya Zemlya test site in the Arctic from 1955 to 1962. About half of the USSR's approximately 200 atmospheric tests were conducted at Novaya Zemlya. Virtually all of their highest yield explosions were conducted there, with a total yield of over 300 megatons. Among these was the world's largest nuclear explosion in 1961, approximately 55 megatons, over 3,000 times the yield of the Hiroshima explosion. In addition to sometimes severe local contamination from fallout, Soviet atmospheric testing also was the greatest contributor to radioactive contamination of Alaska and northern Canada.

The severity of the contamination decreased dramatically after the 1963 Limited Test Ban Treaty, especially in Alaska and Canada, but Soviet underground nuclear weapons testing and peaceful nuclear explosions continued. Russian statements indicate over 130 peaceful nuclear explosions for mining, seismic sounding, or creation of underground storage cavities, were conducted throughout the Soviet Union. A few of these explosions were a part of the program to develop the capability to excavate canals using nuclear explosions. These crater-producing explosions produced widespread contamination. In an August 1987 test, for example, the concrete plug placed to contain the explosion was blown out of the tunnel, and radioactive material spewed into the atmosphere. Some of the other explosions may have contaminated the local groundwater and a few may have leaked radioactive materials. Except for tests at Novaya Zemlya, which sometimes spread contamination into the broader Arctic environment, these leaks probably produced only limited local contamination.

Soviet nuclear reactor accidents also have contributed to contamination of the Arctic. Numerous studies have documented the disproportionately heavy fallout in northern Norway, Sweden and Finland from the Chernobyl accident in April 1986. Fifteen of the Chernobyl-type nuclear reactors remain in operation in the former Soviet Union, and together with other types of old, unsafe Soviet-designed reactors, comprise over half of the power reactors now operating in the Commonwealth of Independent States and Eastern Europe. In the Arctic, four small reactors using similar technology to the Chernobyl reactors are at the remote settlement of Bilibino in the Russian Far East, and a power plant on the Kola peninsula has four aging pressurized water reactors. The demise of the USSR and its East European client governments has left all of the reactors largely bereft of material support and regulatory guidance. The situation is made worse by the region's severe economic problems, which are undermining efforts to maintain and improve safe operations.

In addition to power reactors, hundreds of reactors are aboard CIS submarines and naval vessels, the majority of which are based in or near Arctic waters. A September 1985 explosion during refueling of a Soviet nuclear submarine near Vladivostok illustrates the potential for serious accidents in these reactors. The explosion scattered radioactive material on shore and into the bay, which reportedly was only haphazardly and incompletely cleaned up. In addition, comments by former Soviet navy personnel and two well-publicized sinkings of Soviet submarines since 1986 illustrate the danger fire and accidents pose to CIS submarine reactors. The large number and advancing age of these reactors will increase safety risks, particularly as the CIS begins to dismantle many of the vessels.

Deliberate dumping of radioactive waste materials into Arctic waters or improper land-based storage is another source of radiological pollution. The USSR dumped substantial quantities of radioactive waste in Arctic waters, including the three damaged original nuclear reactors of the icebreaker Lenin, and reportedly reactors from several submarines, including some with nuclear fuel aboard. Radioactive wastes, mostly from naval reactors, also are buried on Arctic shores. Only Soviet records, if any, or detailed scientific surveys can determine the amount, type and potential hazards from the material which has been dumped. I expect we will learn more about these and other concerns in light of new scientific cooperation, such as the joint Russian-Norwegian expedition to survey nuclear waste disposal sites in the Kara Sea planned for this month, and information-sharing made possible by the collapse of Communism.

The newly free republics of the former Soviet Union and Eastern Europe face enormous environmental challenges. The deteriorating industrial infrastructure presents a high risk of disasters. The chemical and energy sectors, where much of the equipment is old and in need of replacement, appear to face the highest risk, but serious breakdowns could occur in railroads, civil aviation, and nuclear power plants. In some cases, accidents have already occurred. For example, an oil well in Uzbekistan drilled with inadequate equipment ruptured in March, contaminating farmland and threatening to pollute a vital river. Only through intensive round-the-clock efforts, aided by U.S. experts who are in turn supported by U.S. intelligence information, were workers able to cap the well and protect the river.

Environmental destruction caused by Soviet troops in Eastern Europe is adding substantially to the already heavy cleanup burdens new governments face as the result of four decades of environmental neglect by the region's former communist rulers. The destruction being revealed by the pullout of Soviet forces clearly will take many years and billions of dollars to repair. Corroded petroleum, oil and lubricants pipelines and storage tanks, as well as poor fuel-handling practices make contamination of soil and groundwater the most ubiquitous pollution problem at former Soviet facilities. Lax safety standards combined with poor storage and accounting practices at ammunition depots have led to soil and water contamination with a variety of heavy metals, acids and other toxic—and often explosive—materials. Solvents, paints, coat-

ings, and plating materials have been poorly stored and carelessly dumped. Troop maneuvers involving heavy tracked vehicles and live firing exercises have destroyed terrain, worsened erosion and water pollution, and contaminated the soil with lead and other substances. Unexploded ordnance presents a safety hazard in and around training areas. East European governments are assessing the dimensions of the pollution problem they have inherited from the Soviet military, but it probably will be many years before these areas can be cleaned up and returned to productive use.

Another region struggling with the residue of Soviet actions is Central Asia's Aral Sea basin. Over the past 30 years, Soviet efforts to expand Central Asian cotton production, which required diverting large quantities of the water from rivers that feed the Aral, has reduced the sea by over 40 percent of its volume and 60 percent of its surface area. The leaking and dumping of pesticides into water supplies, the absence of a water pricing policy, and fierce competition for water, particularly among the Uzbeks and Turkmen, have significantly worsened Central Asia's critical water situation. Existing economic, political and ethnic tensions in the region are being further strained by Aral refugees moving to cities in search of guaranteed medical care, secure employment, a stable source of drinking water, and essential food stuffs. Central Asian leaders faced with serious economic and political difficulties have discussed cooperation on environmental issues but have yet to formulate, much less implement, a concrete plan to halt the Aral's desiccation. Even under the best possible circumstances, with effective regional cooperation and massive foreign assistance, it would take at least five to 10 years of consistent effort before any progress in halting the Aral's destruction can be realized. Without such cooperation, the Aral basin is likely to become an environmental dead zone.

Although the CIS is faced with a daunting legacy of environmental problems, it is making progress in some areas. For example, for several years they have been converting highly radioactive civilian and military waste to glass in order to immobilize it and make it more manageable. In other areas, key data on existing and potential environmental problems does not exist because Soviet authorities feared collecting the data might compromise secret activities.

The CIS countries will be unable to meet the costs of cleanup, estimated at billions of dollars. Russia took the lead in launching an environmental protection plan based on economic incentives in 1991, but the lack of revenues as industrial output declines has resulted in a negative balance that is getting worse. Although CIS environmental ministers have agreed to cooperate on some environmental issues, such as joining with the European community on funds to help with costs incurred from Chernobyl, each country has turned to the West for aid, including technology and expertise, and will continue to do so. But they have yet to prioritize needs, or to resolve such issues as ownership of land and industrial assets and liability for damages.

For its part, CIA and the Intelligence Community are helping U.S. agencies working with the CIS to identify the most pressing

problems so that our government leaders can ensure that U.S. assistance is used effectively.

The issues that I've talked about today are all considered non-traditional intelligence issues. They don't constitute the bulk of our work, as Senator Murkowski indicated, but they are important areas of interest to the President, the Congress, and others in our government. In an era of declining budgets, it will be a special challenge for us in the Intelligence Community to enhance our capabilities in some of these newer areas while continuing to monitor more traditional concerns such as proliferation, terrorism, regional disputes, the former Soviet Union, and aspects of international economic affairs.

Thank you, Mr. Chairman.

Senator MURKOWSKI. Thank you very much, Mr. Gates.

I think you've certainly laid out the situation as it exists, and certainly highlighted the exposure. I wonder if you can provide us with any explanation relative to the prevailing lackadaisical attitude that has been evidenced in the Soviet's disposal of high level nuclear waste, recognizing that they have a knowledge of their exposure if nuclear wastes are improperly disposed of. Can you enlighten us at all on why there was not more consideration given to the proper disposal of this waste?

Director GATES. Well, it's hard to say, but I would speculate that the primary reason, particularly during the period of the worst pollution, in the 1940's and 1950's, had to do with the urgency of the tasks of producing nuclear weapons and the single-mindedness with which that was undertaken by the Soviet government at the time, without regard for the costs, either financial or environmental or the impact on human life, in terms of exposure of individuals to radioactive contamination and so forth. Over the years, there was some gradual improvement in Soviet handling of radioactive wastes, but it was throughout decidedly inferior to the handling of that waste elsewhere in the world. For example, the Soviets moved from dumping radioactive waste, high levels of radioactive waste, into rivers; they moved from that to dumping them in lakes, and then into storage containers; and now this new measure that I described of turning it into glass to immobilize it. So there have been some improvements over the years, but fundamentally these measures have been decidedly inferior to those in the West and have clearly been inadequate.

Senator MURKOWSKI. I wonder if you have any information relative to the health effects on the residents of the areas. It's a vast area. I gather there is not much documentation. But I can recall a meeting I had in Washington with a gentleman by the name of Nikolai Vorontsov who was the former environmental minister of the Soviet Union. He made some startling revelations about the health effects on residents, but much of that information has not been able to be substantiated because of lack of any centralized documentation.

Director GATES. We don't have any independent assessment of the impact on the population. There have been some studies, we understand, done by Soviet authorities in the past, but it's our belief that these studies are probably deeply flawed because of the unreliability of the data gathering and the way in which the stud-

ies were carried out and also a political agenda associated with the studies. I think that the kind of studies that are needed of this sort may now become possible with the collapse of Communism and with greater levels of interest on the part of the new Russian authorities.

Senator MURKOWSKI. Cooperation obviously between Russia and the United States on the environment depends on stability of government, and there's always a continued concern about President Yeltsin's, I won't say state of health, but the state of the political situation over there. The economic situation in Russia is obviously a factor in that stability. I wonder if you could give us any assessment on the current status of that stability. Might we look forward with pretty good odds to a continuation of the current government, or is there still a relatively high level of risk that the bad guys in the wings are ready to come out and reinstitute the regime that we had previously seen prevalent in Russia?

Director GATES. Well, I think that there's no possibility of a restoration of the previous regime or of Communism. As you suggest, Russia, in particular, is undergoing severe economic hardship. It clearly has political implications. President Yeltsin has a fine line to walk between going forward with political and economic reform and at the same time trying to provide or to assure that people are fed and that people continue to have jobs. So far he remains clearly the most popular and, I would say, the most skilled politician in Russia. His poll numbers have been declining over the months as these economic hardships have increased and as the measures, the economic reform measures, have begun to bite. But I think it's reasonable to say that we see no imminent threat to his continuation in office, and I think he still has tremendous public support. I think reform continues to have substantial support. But there are undoubtedly going to be some zigzags in this course as these people try to do something that's virtually unprecedented in history, and that is try to change their political and economic systems from a 1,000 year legacy of autocracy, Communism and state-directed economic activity to a Western-style democracy, and market economy. It's never been done before, certainly not on this scale, so I think it would be unfair to Mr. Yeltsin to underestimate the challenge that faces him. I think he's done a pretty remarkable job so far.

Senator MURKOWSKI. I'm wondering, in our relationship with the Russians relative to monitoring activities associated with the environment, is it on the basis of a quid pro quo where they want something from us in order for you to get a cooperative effort on a joint evaluation of a particular environmental priority? In other words, if we are going to go in and evaluate sites of nuclear activity, do they want some of our information as well, or are they pretty much in a cooperative mode where they understand that they need our help.

Director GATES. We have not had any exchanges with the Russians, among the intelligence services, on information relating to nuclear waste or the kinds of environmental problems that I discussed in my statement. There is, in our government, a federal coordinating council on science, engineering and technology, and there is a subgroup of that that deals with environmental issues, and it is in that forum that discussions with the Russians would

go forward I think, in terms of exchanges of data on the kinds of issues we'd been discussing, that would be more under the auspices of other agencies of the government than the Intelligence Community.

Senator MURKOWSKI. You mentioned in your statement the thought of clearing scientists for classified information. I wonder if you can elaborate a little further, because I know it would be of interest to many who are going to testify today, relative to their participation with the Central Intelligence Agency. What specifically might you have in mind that you can tell us?

Director GATES. The basic purpose in the endeavor that is underway now is to ascertain whether in the now 30-some-year-old archive of satellite-collected information, particularly imagery satellites, there is information in that data bank, stretching back over that period of time, that would allow environmental scientists to document change in the global environment. And the first step in what we're trying to do, and there's a coordinating committee made up of Congressional staff, the Intelligence Community, and the scientific community, is to identify scientists in some 10 different disciplines who would receive security clearances and be given access to this data in order that they might ascertain whether or not there is value in it for the scientific community. And if they conclude that there is, then the next step will be for us to figure out how we might be able to make that data available for exploitation. We also probably will draw on their help and offer our help, particularly in this NASA project, with respect to the information-handling architecture for the vast quantities of data that are going to be collected by the earth observation system. We probably have more experience than anyone in the world in terms of processing and integrating this kind and quantity of data, and I think we can perhaps have something to offer in that arena as well. So the purpose of it is simply, in effect, to allow the formation of a search party to explore this data and see if there's something there that can be of value.

Senator MURKOWSKI. Senator Boren and I collaborated on this question and we thought it appropriate to have it in the record, and as you know, our Intelligence Community voted on the 1993 Intelligence budget, which the Senate will debate when we return in September. And there's going to be some who want to take some deep cuts, as much as an additional two billion. I'm curious to know for the record if this amendment is adopted, how it will affect the ability of the Intelligence Community to continue its emerging role in global environmental issues.

Director GATES. Well, there are probably some things that we can do to be helpful that represent little additional cost to us. But I think that there is an interest, both in the Administration and in the Congress, in having us expand this effort and undertake some more ambitious activities. While the environment is an important issue from a national standpoint and a very high priority from a national standpoint, in the prioritization of intelligence issues given to us by the President and the government, and the Congress I might add, clearly it is not as important as a number of other issues that are the more traditional province of our activities. So clearly, deep cuts, while they might not stop the kind of

activity that I've just described that we're prepared to go, to undertake, they would clearly circumscribe our devoting other additional assets to it.

Senator MURKOWSKI. I want to take this opportunity to thank you for inviting Dr. Wilford Weeks of the Geophysical Institute here at the University of Alaska to be a member of your panel of scientists, and I think this confirms our belief that Alaskan scientists have achieved a level of experience in Arctic science that is recognized throughout the world. I want to thank you very much, Mr. Gates, for being with us today. I also want to recognize your Congressional affairs liaison who is with us, Stan Moskowitz, another Irishman. I don't know where Stan is but he's out there somewhere. And I know you got up very, very early this morning to fly up to Fairbanks and be with us, and we're going to have one more panel and break for lunch. We'll have additional questions and you can expect questions as well from other members of the committee when I get back and brief them, and I want to again thank you. I think that your testimony has provided a level of credibility with regard to information that has been gathered by our Intelligence Community on what has happened in the former Soviet Union. And it's now a question of our government and our scientists to address, in cooperation with the Russian scientific community, a procedure for evaluation monitoring and then an action oriented program to initiate what should be done. And I think it's important to keep in mind that what we're attempting to do is to make decisions based on sound science rather than emotion, because as highlighted by Mr. Bohlen and Mr. Gates, one could move to some rather dramatic conclusions with this information on its surface as opposed to the facts that we need to generate. And that's something that occasionally in Washington we lack. Oftentimes, an individual who makes the most compelling speech, who advances the most emotional argument, or who has the best lobby often prevails. On the other hand, I think it's fair to say that sometimes there's a reluctance in the scientific community to step forward and lay their reputation on the line with recommendations. But I think we are appealing for that, we need that, and the presentation by the panel this morning, I think, sets the tenor for the balance of the witnesses relative to the obligation we have before us. And without the facts and the information, we will not be able to generate action. So I want to thank you, gentlemen. You may be excused.

I would call the Honorable Donald O'Dowd, Chairman of the Arctic Research Commission. With Dr. O'Dowd no stranger to these premises, please proceed, Dr. O'Dowd.

[The prepared statement of Dr. O'Dowd follows:]